Docket 86428AJA
Customer No. 01333

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of

Paul L. Zengerle et al

Method Of Preparation Of Direct Dispersions Of Photographically Useful Chemicals

Serial No. 10/692,535

Filed 24 October 2003

Group Art Unit: 1752

Examiner: Amanda C. Walke

Mail Stop APPEAL BRIEF-PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

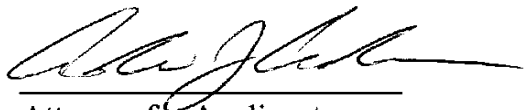
Sir:

APPEAL BRIEF PURSUANT TO 37 C.F.R. 41.37

Applicants hereby appeal to the Board of Patent Appeals and Interferences from the Examiner's Final Rejection of claims 1-36 which was contained in the Office Action mailed December 13, 2006.

A timely Notice of Appeal was electronically filed on March 13, 2007. A Notice of Panel Decision from Pre-Appeal Brief Review was mailed April 24, 2007, re-setting the time period for filing of an Appeal Brief to one month from the mailing of such notice.

Respectfully submitted,



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Real Party In Interest

Eastman Kodak Company is assignee and the real party in interest.

Related Appeals And Interferences

No appeals or interferences are known which will directly affect or be directly affected by or have bearing on the Board's decision in the pending appeal.

Status Of The Claims

Claims 1-36 are pending in the application.

Claims 1-36 stand rejected under 35 USC § 103.

Claims 1-36 are being appealed.

Appendix I provides a clean, double spaced copy of the claims on appeal.

Status Of Amendments

No amendment has been filed after the Final Rejection dated December 13, 2006.

Summary Of Claimed Subject Matter

Independent claim 1 is directed towards a process for making a direct dispersion (see, e.g., page 2, lines 19-21) of a photographically useful material (page 5, lines 10-23) comprising: mixing (i) an aqueous phase (page 11, line 21 to page 12, line 16) and (ii) a liquid organic phase (page 6, lines 18-21; page 10, lines 6-25) under conditions of shear or turbulence (page 12, lines 19-31) in the substantial absence of auxiliary solvent (page 2, lines 19-21) to form a direct dispersion of the organic phase dispersed in the aqueous phase; wherein the liquid organic phase comprises one or more photographically useful materials (page 5, lines 10-23) and one or more organic solvents (page 4, lines 20-31) having a boiling point of at least 150°C (page 6, lines 20-22), a molecular weight less than or equal to 300 (page 6, lines 26-27), and a solvatochromic parameter β value greater than or equal to 0.50 (page 6, ines 27-28), and wherein the weight ratio of the sum of the solvents having

a boiling point of at least 150°C, a molecular weight less than or equal to 300, and a solvatochromic parameter β value greater than or equal to 0.50 to the photographically useful materials does not exceed 0.25 (page 6, lines 28-31).

Claim 35 is directed towards a direct dispersion obtained by the process of claim 1 (page 4, lines 6-7). Claim 36 is directed towards a photographic element comprising one or more light sensitive silver halide emulsion layers having associated therewith a direct dispersion obtained by the process of claim 1, wherein the coated level of solvents having a boiling point of at least 150°C, a molecular weight less than or equal to 300, and a solvatochromic parameter β value greater than or equal to 0.50 in any layer of the element is no greater than 200 mg/m^2 (page 4, lines 7-13).

Grounds Of Rejection To Be Reviewed On Appeal

1. Claims 1-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lobo et al. (5,589,322) or Connelly et al (5,998,120).

Arguments

Obviousness Rejection of Claims 1-36 over Lobo et al or Connelly et al

The present invention describes an improved method for making direct dispersions of photographic useful materials (PUMs) for incorporation into silver halide photographic elements. In particular, the present invention teaches the use of a relatively low level (i.e., weight ratio relative to the amount of PUMs does not exceed 0.25) of specified organic solvents (i.e., those having a boiling point of at least 150C, a molecular weight less than or equal to 300, and a solvatochromic parameter β value greater than or equal to 0.50) specifically in a direct dispersion making process. As employed in the photographic art, "direct" dispersion making process are distinguished from other dispersion making processes by the feature that the PUM is homogenized or dispersed into an aqueous solution in the substantial absence of any auxiliary solvent (see, e.g., page 2, lines 19-21). As discussed in the paragraph bridging pages 9-10 of the specification, while the use of such specified solvents having relatively low molecular weight and relatively high solvatochromic parameter values has been typically avoided as such solvents may result in

deleterious effects in photographic performance or physical quality, the use of such solvents at relatively low levels as claimed has been surprisingly found to enable the preparation of low-cost, high-yield, environmentally friendly direct dispersions for photographic materials which provide improved manufacturing efficiencies without causing such deleterious effects. As demonstrated in the examples, the specific solvents required in accordance with the claimed invention have been found to be particularly advantaged over other organic solvents for their ability to reduce to oil phase solution at temperatures used in the direct dispersion process. In particular, with the enhanced solubility characteristics that they provide, a much wider variety of high melting PUM's become amenable to the direct dispersion making process. They also enable direct dispersions to be prepared at reduced permanent solvent loads to facilitate thinner coated layers and reduced material (solvent and gelatin) laydowns, which lowers manufacturing cost. They also allow direct dispersion oil phases to be prepared at lower temperatures to avoid coupler decomposition problems, which may be commonly encountered with the direct process.

The Examiner's statement in the final rejection that both Lobo et al and Connelly et al disclose a process for preparing a direct dispersion of a PUM where the compounds used "appear to be employed in amounts falling within the scope of the instant claim limitations (meeting the instantly claimed ratio)" represents clear error as there is no support for such "apparent" teaching. In particular, the Examiner has failed to identify where in either reference there is an actual disclosure that would support such statement, such that either reference would teach or suggest the claimed combination of limitations of Applicants' process for making a direct dispersion claim 1, resulting direct dispersion claim 35, and photographic element claim 36 comprising such a direct dispersion.

While Connelly teaches the use of various types of gelatins, photographically useful materials, and solvents in the preparation of a direct dispersion, and Lobo et al teaches the use of ionic polymers, photographically useful materials, and solvents in the preparation of a direct dispersion, there is no teaching or suggestion in either reference of the use of solvents meeting the requirements of the present invention specifically at the claimed solvent to photographically useful material weight ratio in a direct dispersion making process. While the lists of solvents at col. 5 of Connelly et al and column 6 of Lobo et al include a single

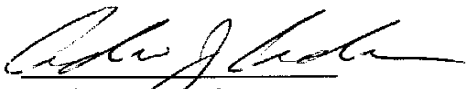
example of a solvent meeting the specified properties required for the solvent as defined in the claim 1 of the present invention (i.e., N,N-Diethyldodecanamide), the others do not, and there is further no teaching or suggestion in either reference to employ such single solvent in accordance with the further requirements of the present claimed invention. In particular, it is noted that only dibutyl phthalate is employed in the examples of Lobo et al, and only di-butyl phthalate and di-undecyl phthalate are employed as high-boiling solvents in the examples of Connelly et al, which solvents do not meet the requirements of the solvent as defined in claim 1 of the present claimed invention. Further, the solvent to photographically useful material weight ratios in dispersions prepared in all the Examples of the Connelly et al and Lobo et al are well above the present claimed requirement. As there is further no specific teaching to employ any other specific solvents at necessarily lower weight ratios so as to be a teaching or suggestion of the present claimed invention, Connelly et al and Lobo et al clearly do not establish a prima facie case of obviousness with respect to the present claimed invention, and the asserted final rejection is in clear error.

Further, while a prima facie case of obviousness has clearly not been established based on the Examiner's bare unsupported statement as to what Connelly et al and Lobo et al "appear" to disclose, it is additionally clear that Connelly et al and Lobo et al are directed towards solving different problems than that of the present invention, and that there is accordingly no further teaching or suggestion that would lead one skilled in the art to the present invention. For both references, e.g., there is no mention of the desire to minimize any particular solvent levels relative to PUM levels with direct dispersions, and no teaching of any combination of solvent parameters that would facilitate solvent minimization in direct dispersions. Clearly, in addition to not disclosing what the Examiner alleges "appears" to be disclosed, such references do not include any other further teachings that would establish any prima facie case of obviousness with respect to the present claimed invention, and reversal of the final rejection of the present claims over such references is respectfully urged.

Conclusion

For the above reasons, Appellants respectfully request that the Board of Patent Appeals and Interferences reverse the rejection by the Examiner and mandate the allowance of Claims 1-36.

Respectfully submitted,



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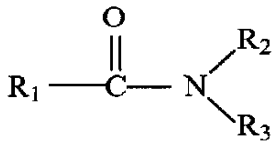
If the Examiner is unable to reach the Applicant(s) Attorney at the telephone number provided, the Examiner is requested to communicate with Eastman Kodak Company Patent Operations at (585) 477-4656.

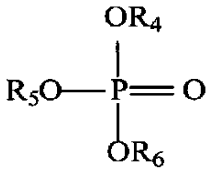
Appendix I - Claims on Appeal

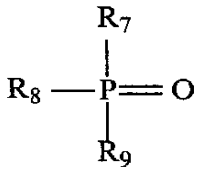
1. A process for making a direct dispersion of a photographically useful material comprising: mixing (i) an aqueous phase and (ii) a liquid organic phase under conditions of shear or turbulence in the substantial absence of auxiliary solvent to form a direct dispersion of the organic phase dispersed in the aqueous phase; wherein the liquid organic phase comprises one or more photographically useful materials and one or more organic solvents having a boiling point of at least 150°C, a molecular weight less than or equal to 300, and a solvatochromic parameter β value greater than or equal to 0.50, and wherein the weight ratio of the sum of the solvents having a boiling point of at least 150°C, a molecular weight less than or equal to 300, and a solvatochromic parameter β value greater than or equal to 0.50 to the photographically useful materials does not exceed 0.25.

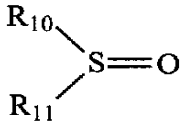
2. The process of claim 1, wherein the one or more organic solvents having a boiling point of at least 150°C, a molecular weight less than or equal to 300, and a solvatochromic parameter β value greater than or equal to 0.50 are selected from amides, anilides, phosphate esters, phosphine oxides, sulfoxides, ureas and ketones.

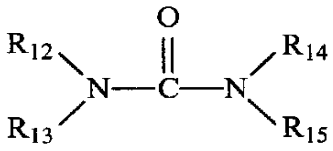
3. The process of claim 1, wherein the one or more organic solvents having a boiling point of at least 150°C, a molecular weight less than or equal to 300, and a solvatochromic parameter β value greater than or equal to 0.50 are selected from compounds of Formulas I through VI:

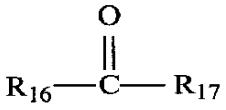
I 

II 

III 

IV 

V 

VI 

wherein R_1 through R_{17} each independently represent hydrogen or a substituted or unsubstituted alkyl or aryl group.

4. The process of claim 3, wherein the liquid organic phase comprises a combination of organic solvents consisting essentially of one or more primary permanent high-boiling solvents and the one or more solvents having a boiling point

of at least 150°C, a molecular weight less than or equal to 300, and a solvatochromic parameter β value greater than or equal to 0.50, where each primary solvent employed in the organic phase mixture of the dispersions has a boiling point of at least 150°C and either (a) a molecular weight of greater than 300, (b) a solvatochromic parameter β value less than 0.50, or (c) a molecular weight of greater than 300 and a solvatochromic parameter β value less than 0.50, and where the weight ratio of the sum of the primary permanent solvents to the sum of the solvents having a boiling point of at least 150°C, a molecular weight less than or equal to 300, and a solvatochromic parameter β value greater than or equal to 0.50 is greater than 1.

5. The process of claim 4, wherein the photographically useful material comprises a dye image-forming coupler.

6. The process of claim 5, wherein the weight ratio of the sum of the primary permanent solvents to the sum of the solvents having a boiling point of at least 150°C, a molecular weight less than or equal to 300, and a solvatochromic parameter β value greater than or equal to 0.50 is at least 2.

7. The process of claim 5, wherein the weight ratio of the sum of the primary permanent solvents to the sum of the solvents having a boiling point of at least 150°C, a molecular weight less than or equal to 300, and a solvatochromic parameter β value greater than or equal to 0.50 is at least 3.

8. The process of claim 5, wherein the weight ratio of the sum of the primary permanent solvents to the sum of the solvents having a boiling point of at least 150°C, a molecular weight less than or equal to 300, and a solvatochromic parameter β value greater than or equal to 0.50 is at least 4.

9. The process of claim 5, wherein the weight ratio of the sum of the solvents having a boiling point of at least 150°C, a molecular weight less than or equal to 300, and a solvatochromic parameter β value greater than or equal to 0.50 to the photographically useful materials does not exceed 0.20.

10. The process of claim 5, wherein a primary solvent employed in the organic phase mixture of the dispersion is a phthalic acid alkyl ester, a phosphoric acid ester of molecular weight greater than 300, a citric acid ester, a benzoic acid ester, an aliphatic amide of molecular weight greater than 300, a mono or polyvalent alcohol of molecular weight greater than 300, or an aliphatic dioic acid alkyl ester.

11. The process of claim 5, wherein a primary solvent employed in the organic phase mixture of the dispersion is a phthalic acid alkyl ester, a phosphoric acid esters of molecular weight greater than 300, or an aliphatic dioic acid alkyl ester of the formula R-$(CH_2)_m$-R' wherein R and R' each represent an alkoxycarbonyl group containing not more than 8 carbon atoms and m is an integer of from 1 to 10.

12. The process of claim 5, wherein the primary solvent comprises tricresylphosphate or dibutylsebacate.

13. The process of claim 5, wherein the weight ratio of dispersed coupler to primary solvents is from 0.1:1 to 10:1.

14. The process of claim 5, wherein the weight ratio of dispersed coupler to primary solvents is from 0.25:1 to 5:1.

15. The process of claim 5, wherein the weight ratio of dispersed coupler to primary solvents is from 0.25:1 to 2:1.

16. The process of claim 3, wherein R_1 through R_{17} each independently represent a substituted or unsubstituted alkyl or aryl group.

17. The process of claim 3, wherein:

in Formula I, R_1 is alkyl or aryl, R_2 is alkyl, and R_3 is alkyl or aryl, wherein the total number of carbon atoms contained in R_1, R_2, and R_3 is less than 20;

in Formula II, R_4, R_5 and R_6 are alkyl or aryl, wherein the total number of carbon atoms contained in R_4, R_5, and R_6 is less than 15;

in Formula III, R_7, R_8 and R_9 are alkyl groups, and the total number of carbon atoms contained in R_7, R_8 and R_9 is less than 20;

in Formula IV, R_{10} and R_{11} are alkyl groups, wherein the total number of carbon atoms contained in R_{10} and R_{11} is less than 19;

in Formula V, R_{12}, R_{13}, R_{14}, and R_{15} are alkyl or aryl, wherein the total number of carbon atoms contained in R_{12}, R_{13}, R_{14}, and R_{15} is less than 20; and

in Formula VI, R_{16} and R_{17} combine to form an aliphatic closed ring.

18. The process of claim 17, wherein the one or more organic solvents having a boiling point of at least 150°C, a molecular weight less than or equal to 300, and a solvatochromic parameter β value greater than or equal to 0.50 includes at least one compound of Formula I, where R_1 is a straight chain alkyl or aryl group, R_2 is a straight chain alkyl group, and R_3 is straight chain alkyl or aryl group, or R_1 combines with R_2 or R_3 to form a closed ring.

19. The process of claim 18, wherein the compound of Formula I is N,N-diethylbutyramide, N,N-diethyl-m-toluamide, N-butylacetanilide, or N-methylpyrrolidone.

20. The process of claim 17, wherein the one or more organic solvents having a boiling point of at least 150°C, a molecular weight less than or equal to 300, and a solvatochromic parameter β value greater than or equal to 0.50 includes at least one compound of Formula II, where R_4, R_5 and R_6 are alkyl groups.

21. The process of claim 20, where the compound of Formula II is trimethylphosphate or triethylphosphate.

22. The process of claim 17, wherein the one or more organic solvents having a boiling point of at least 150°C, a molecular weight less than or equal to 300, and a solvatochromic parameter β value greater than or equal to 0.50 includes at least one compound of Formula III.

23. The process of claim 22, wherein the compound of Formula III is trimethylphosphine oxide or triethylphosphine oxide.

24. The process of claim 17, wherein the one or more organic solvents having a boiling point of at least 150°C, a molecular weight less than or equal to 300, and a solvatochromic parameter β value greater than or equal to 0.50 includes at least one compound of Formula IV.

25. The process of claim 24, wherein the compound of Formula IV is dimethylsulfoxide or di-n-butylsulfoxide.

26. The process of claim 17, wherein the one or more organic solvents having a boiling point of at least 150°C, a molecular weight less than or equal to 300, and a solvatochromic parameter β value greater than or equal to 0.50 includes at least one compound of Formula V.

27. The process of claim 26, where the compound of Formula V is tetramethylurea or 1,3-dimethyl-1,3-diphenylurea.

28. The process of claim 17, wherein the one or more organic solvents having a boiling point of at least 150°C, a molecular weight less than or equal to 300, and a solvatochromic parameter β value greater than or equal to 0.50 includes at least one compound of Formula VI.

29. The process of claim 28, where the compound of Formula VI is cyclohexanone or cyclopentanone.

30. The process of claim 1, wherein the weight ratio of the sum of the solvents having a boiling point of at least 150°C, a molecular weight less than or equal to 300, and a solvatochromic parameter β value greater than or equal to 0.50 to the photographically useful materials does not exceed 0.20.

31. The process of claim 1, wherein the photographically useful material comprises a dye image-forming coupler.

32. The process of claim 1, wherein the liquid organic phase comprises one or more photographically useful materials and one or more organic solvents having a boiling point of at least 150°C, a molecular weight less than or equal to 250, and a solvatochromic parameter β value greater than or equal to 0.50, and wherein the weight ratio of the sum of the solvents having a boiling point of at least 150°C, a molecular weight less than or equal to 250, and a solvatochromic parameter β value greater than or equal to 0.50 to the photographically useful materials does not exceed 0.25.

33. The process of claim 1, wherein the liquid organic phase comprises one or more photographically useful materials and one or more organic solvents having a boiling point of at least 150°C, a molecular weight less than or equal to 300, and a solvatochromic parameter β value greater than or equal to 0.60, and

wherein the weight ratio of the sum of the solvents having a boiling point of at least 150°C, a molecular weight less than or equal to 300, and a solvatochromic parameter β value greater than or equal to 0.60 to the photographically useful materials does not exceed 0.25.

34. The process of claim 1, wherein the liquid organic phase comprises one or more photographically useful materials and one or more organic solvents having a boiling point of at least 150°C, a molecular weight less than or equal to 300, and a solvatochromic parameter β value greater than or equal to 0.70, and wherein the weight ratio of the sum of the solvents having a boiling point of at least 150°C, a molecular weight less than or equal to 300, and a solvatochromic parameter β value greater than or equal to 0.70 to the photographically useful materials does not exceed 0.25.

35. A direct dispersion obtained by the process of claim 1.

36. A photographic element comprising one or more light sensitive silver halide emulsion imaging layers having associated therewith a direct dispersion obtained by the process of claim 1, wherein the coated level of solvents having a boiling point of at least 150°C, a molecular weight less than or equal to 300, and a solvatochromic parameter β value greater than or equal to 0.50 in any layer of the element is no greater than 200 mg/m^2.

Appendix II - Evidence

NONE

Appendix III – Related Proceedings

NONE